



STATE OF MAINE
DEPARTMENT OF ENVIRONMENTAL PROTECTION

PAUL R. LEPAGE
Governor

PATRICIA W. AHO
Commissioner

July 6, 2012

To Interested Persons:

RE: Passadumkeag Wind Park Draft Staff Analysis, #L-25597-24-A-N & L-25597-TH-B-N

Dear Interested Person:

Attached you will find a draft staff analysis for the Passadumkeag Wind Park project. This represents the Department's current analysis of the statutory requirements in the Site Location of Development Act, the Natural Resources Protection Act and the Wind Energy Act as they pertain to this project. The Department is providing this document prior to the July 12, 2012 public meeting and is intended to be a basis for discussion and questions.

In advance of the meeting I would like to set a few ground rules.

1. Every effort will be made to allow each interested person an opportunity to speak within the allocated time period. As such, it may be necessary to limit the amount of time each individual has available to speak. So, we ask in advance for your understanding in this regard.
2. All questions and comments should be directed to the Department. If you have questions that you believe the applicant failed to address or that they should address in more detail in their application, please make the request to the Department.

Provided the areas of concern are relevant to a permitting criteria, the Project Manager will follow-up with the applicant to ensure that all necessary and appropriate information is in the Department record.

3. The Department will make every effort to answer your questions during this meeting; however, some technical questions may need to be considered in more detail outside the scope of this meeting. Therefore, the Department reserves the right to defer answers to some questions until sometime after the public meeting but before a Department decision is made.
4. The Department requests that any questions asked by interested persons be provided to the Project Manager in writing at the public meeting at the end of your turn to speak, or as soon as possible after the meeting. This will help to ensure that each question is specifically addressed prior to the issuance of any final permit decision by the

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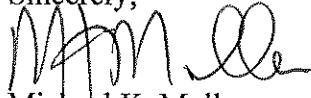
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Department. If interested persons wish to provide written comments in addition to questions, they may do so at their discretion.

The Department welcomes your participation at the public meeting and we will consider all comments during our review of the Passadumkeag Wind Park applications.

Sincerely,

A handwritten signature in black ink, appearing to read 'M. Mullen', with a stylized flourish at the end.

Michael K. Mullen
Licensing and Compliance Coordinator
Division of Land Resource Regulation
Maine Department of Environmental Protection



PAUL R. LEPAGE
GOVERNOR

STATE OF MAINE
DEPARTMENT OF ENVIRONMENTAL PROTECTION

PATRICIA W. AHO
COMMISSIONER

DRAFT DEP STAFF ANALYSIS
of applications for
SITE LOCATION OF DEVELOPMENT ACT and
NATURAL RESOURCES PROTECTION ACT PERMITS
for
THE PASSADUMKEAG WIND FARM
by
PASSADUMKEAG WIND PARK, LLC
(L-25597-24-A-N/L-25597-TH-B-N/L-25597-IW-C-N)
July 5, 2012

1. PROJECT DESCRIPTION:

A. Summary: The applicant proposes to construct an industrial wind turbine project consisting of 14 Vestas 112, 3.0 MW turbines. This project qualifies as an expedited wind energy development as defined in the Wind Energy Act (38 M.R.S. §3451(4)). Each turbine is 84 meters (approximately 276 feet tall) to the center of the hub and a total of 140 meters (approximately 459 feet) to the tip of a fully extended blade. The area of land proposed to be used for the turbine portion of the project is located wholly within property currently used for commercial forestry operations. The site contains developed logging roads that would be upgraded and used to minimize clearing and wetlands impacts. In addition to the turbine farm, the project would include an operations and maintenance (O&M) building as well as associated facilities. The O&M building would be located in the Town of Greenbush, an organized town. The development of the O&M building would result in approximately 3.54 acres of impervious area. The proposed project overall includes 21.47 acres of impervious area and 97.38 acres of developed area.

The turbines would be located on top of Passadumkeag Ridge in Grand Falls Township. Power from the turbines would be collected in a 34.5 kV collector line that would run approximately 17 miles from the ridge along the Greenfield Road through Summit Township, Greenfield Township and Greenbush. Nearly all of this line is an existing distribution line right-of-way immediately adjacent to an existing road.

The applicant is also proposing 1.22 acres of wetland conversion by clearing trees associated with the collector line and altering 9,800 square feet of moderate value inland waterfowl and wading bird habitat (IWWH) in two locations adjacent to the Greenfield Road.

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B. Public Interest: The department received multiple requests for the Board of Environmental Protection to assume original jurisdiction over these applications and hold a public hearing. However, the Board's authorizing statute, 38 M.R.S. § 341-D(2), does not allow the Board to assume jurisdiction over applications for approval of expedited wind energy developments as defined in the Wind Energy Act (38 M.R.S. §3451(4)). As set forth in the Department's Rules, Chapter 2 § 7 (B), the holding of public hearings on applications is discretionary. In this case the Commissioner determined that there was not sufficient credible conflicting technical information submitted and a public hearing was not warranted in order to assist her in understanding the evidence. Therefore, a public hearing was not held. The Department held one public meeting on April 25 at the Greenfield town office. The Department sent letters to all abutters of the project notifying them of the meeting as well as to all town offices and it published a notice in a local newspaper. The Department received many emails and letters from interested persons expressing concerns about the proposed project. The letters and emails describing concerns about the proposed project that were related to standards that are reviewed as part of the Site Location of Development Act and NRPA were considered in the review of the proposal.

Interested persons contend that a series of statements by the applicants concerning greenhouse gas emissions and global warming in the Project Need section of the applications were not substantiated with scientific facts. The applications include a statement that renewable energy demands are increasing and that this project would address concerns about reducing greenhouse gases and particulates from combustion. The Legislature made findings in its adoption of the Wind Energy Act, in 35-A M.R.S.A. §3402, that it is in the public interest to encourage the construction and operation of community wind power generation facilities because wind energy "is an economically feasible, large-scale energy resource that does not rely on fossil fuel combustion or nuclear fission, thereby displacing electrical energy provided by these other sources and avoiding air pollution, waste disposal problems and hazards to human health from emissions, waste and by-products". Further 35-A M.R.S. §3454 directs the Department to presume that an expedited wind energy development provides energy and emissions-related benefits. The Department defers to the Legislature's findings and also utilizes its knowledge and expertise in this area to evaluate the statements. The policy considerations of the Legislature in enacting the Wind Energy Act are relevant in the Department's interpretation of its statutes, but the Department is required to focus on the statutory licensing criteria set forth by the Legislature. The amount of potential climate benefit from the proposed project is not a factor under the licensing criteria.

While the applications were being reviewed, the Department received comments from some interested persons in the surrounding towns regarding how the proposal would negatively impact tourism. The Department also received some comments about the shortcomings of the Wind Energy Act. These concerns are noted but are only considered to the extent they address permitting criteria and are thus within the scope of the Department's review of the proposed project.

The project is shown on a series of plans included with the application, the first of which is entitled "Predevelopment Drainage Plan", prepared by the James W Sewall Company dated January 30, 2012.

C. Current Use of Site. The site of the proposed project is currently undeveloped fields and woodlands and is currently used extensively as commercial forest. There are no structures on the property; except for the structures on two leased camp lots.

2. FINANCIAL CAPACITY AND TITLE RIGHT OR INTEREST:

The applicant estimates the total cost of the project to be \$79 million.

Passadumkeag Wind Park, LLC is a legal entity authorized to do business in the State of Maine and is a wholly owned subsidiary of Quantum Utility Generation, LLC (Quantum). Passadumkeag Wind Park, LLC was established to develop and own the Passadumkeag wind project. The application states that Quantum intends to provide all of the funding for the project.

The applicant submitted a letter dated February 1, 2012 from Quantum indicating that it intends to finance the project. In addition the applicant submitted a letter from Price Waterhouse Coopers LLP, dated April 27, 2011, which contains a report of independent auditors indicating total assets of more than \$355 million.

To demonstrate title, right or interest in the property proposed for development, as required in Chapter 2 §11(D) and Chapter 372 § 9 of the Department's rules, the applicant submitted copies of deeds, leases and lease options between the applicant and the property owners for the proposed project site. The applications include deeds which show that the property owners who are leasing to the applicants have ownership over the parcels which are the subject of the leases. The duration and the terms of the leases for the proposed project area are sufficient for the processing of these applications. The applicant also submitted easements for certain adjacent parcels of land pertaining to noise, shadow flicker effects and safety setbacks.

The applicant's financial filings appear to show adequate capacity to fund the project and the deeds and leases appear to be adequate for the area which would be occupied by the project.

3. NOISE:

To address the Site Law standard pertaining to the control of noise, 38 MRSA §484 (3), and the applicable rules, Chapter 375 §10, the applicant submitted a Noise Impact Study entitled “Sound Level Assessment for the Passadumkeag Wind Park Project,” completed by Stantec Consulting, Ltd and dated January 2012 and April 2012. The sound level study was conducted to model expected sound levels from the proposed project, and to compare the model results to the applicable requirements of Chapter 375 § 10.

The Passadumkeag Wind Farm project must comply with Department regulations applicable to sound levels from construction, routine operation and routine maintenance. Chapter 375 §10 applies hourly sound level limits (L_{Aeq-Hr}) at facility property boundaries and at nearby protected locations. Chapter 375§10 (G)(16) defines a protected location as “[a]ny location accessible by foot, on a parcel of land containing a residence or planned residence or approved subdivision near the development site at the time a Site Location of Development application is submitted...”. In addition to residential parcels, protected locations include, but are not limited to, schools, state parks, and designated wilderness areas.

The hourly sound level resulting from routine operation of a development is limited to 75 decibels (dBA) at any development property boundary as outlined in Chapter 375 §10(C)(1)(a)(i). The hourly equivalent sound level limits at any protected location vary depending on local zoning or surrounding land uses and existing (pre-development) ambient sound levels.

Due to the rural nature of the area for which the project is proposed, Department standards require that the applicant meet the “Quiet Location” limits, the Department’s most restrictive sound limits. The applicant proposes to operate the project in compliance with these limits as set forth in Chapter 375 §10 (H)(3)(1). In Quiet Locations, nighttime limits at a protected location apply at the property line of the protected location, or up to 500 feet from sleeping quarters when the property line is greater than 500 feet from a dwelling. For this project there are three protected locations. Pursuant to Chapter 375 § 10 (5)(s) sounds from a regulated development received at a protected location are exempt from the regulations when the owner of the property conveys a noise easement for that location to the generator of the sound. The owners of all three protected locations have entered into noise easements with the applicant.

To assist with the review of the application, the Department retained a noise expert, Peter Guldborg of Tech Environmental, Inc., to review the applicant’s prediction model and associated data as well as other evidence received on the issue of noise.

A. Sound Level Modeling. The applicant’s noise consultant, Stantec Consulting, Ltd., developed a sound level prediction model to estimate sound levels from the operation of the proposed project. The sound model for the project was created using Cadna/A software developed by DataKustik of Germany. Cadna/A allows the consultant to construct topographic surface models of area terrain for calculating sound attenuation from multiple sound sources such as wind turbines. The locations of the proposed turbines, roads, parcels,

land uses and waterbodies have been entered into Cadna/A in order to calculate sound levels at various points within the proposed project area. Sound level predictions are calculated in accordance with ISO 9613-2, which is an international standard for calculating outdoor sound propagation.

This computerized model is capable of predicting sound levels at specific receiver positions originating from a variety of sound sources. Applicable national or international standards can also be included in the analysis as described above. Cadna/A accounts for such factors as:

- Distance attenuation (i.e. geometrical distortion of sound was distance);
- Geometrical characteristics of the source and receivers;
- Atmospheric attenuation (i.e. the rate of sound absorption by atmospheric gases in the air between sound sources and receptors);
- Ground attenuation (effect of sound absorption by the ground as sound passes over various terrain and vegetation types between source and receptor);
- Screening effects of surrounding terrain; and
- Meteorological conditions and effects.

Conservative modeling assumptions were applied when analyzing the sound impacts of the project to allow for uncertainties in the sound power output from the turbines and inherent uncertainties in mathematical modeling of the sound propagation. To be conservative, a factor of three dBA was added to the manufacturer's sound power level of the turbines. Two dBA were added to account for uncertainty in the mathematical modeling.

Sound associated with the operational phase of the project was modeled excluding other existing sound sources. Modeling the sound generated from the operation of the 14 turbines was conducted by first obtaining the manufacturer's sound power level specifications (106.5 dBA) and then applying factors to account for the manufacturer's uncertainty and the modeling uncertainty for a total sound level of 111.5 dBA from each turbine.

Although substation transformers emit sound, they were not considered significant sound sources by the applicant's consultant due to the low sound output and relatively large distance from protected locations and were not included in the model. The Department and Peter Guldberg found this appropriate and acceptable.

B. Short Duration Repetitive Sound. Chapter 375 §10(G)(19) defines short duration repetitive sound (SDRS) as "a sequence of repetitive sounds which occur more than once within an hour, each clearly discernible as an event and causing an increase in the sound level of at least 6 dBA on the fast meter response above the sound level observed immediately

before and after the event, each typically less than ten seconds in duration, and which are inherent to the process or operation of the development and are foreseeable.” Chapter 375 requires that if any defined SDRS results from routine operation of a development, 5 dBA must added to the observed level of sound.

The January 2012 report submitted by the applicant summarized measurements of operating wind turbines in Maine and data from published literature that indicate that sound level fluctuations during the blade passage of wind turbines typically range from 2 to 5 dBA with an occasional event reaching 6 dBA or more. However, the applicant’s report concludes that the occurrence of these higher fluctuations would be so infrequent that they are not expected to meet the Department’s definition of SDRS or affect the predicted sound levels. The Department’s consultant, Tech Environmental reviewed this study and stated, “Since the 5-dBA penalty for SDRS is applied only to the SDR sounds and not the entire measurement interval, the infrequent occurrence of SDR sound events are not expected to significantly affect the project’s sound levels and no adjustment to the acoustic model predictions for 1-hour LeqA levels is necessary.” Based on the applicant’s January 2012 report and the assessment of the Department’s consultant, it appears the proposed project is unlikely to generate short duration repetitive sounds. Compliance testing for SDRS which will be incorporated into the post-construction noise monitoring program (discussed later in this section) after project completion would provide insurance that SDRS is not occurring.

C. Tonal Sound. As defined in Chapter 375 §10(G) (24), a regulated tonal sound occurs when the sound level in a one-third octave band exceeds the arithmetic average of the sound levels in the two adjacent one-third octave bands by a specified dBA amount based on octave center frequencies. Chapter 375 requires that 5 dBA be added to the observed level of any defined tonal sounds that results from routine operation of a development.

The applicant’s January 2012 report states that the turbines proposed for use, Vestas V112, carry Sound Level Performance Standard warranties that they will not produce a tonal sound as it is defined by Maine’s Noise Regulations. In its review of the applicant’s study on behalf of the Department, Tech Environmental confirmed that an analysis of the sound power octave band spectrum for the Vestas V112 reveals that it has no potential for creating a tonal sound as defined in the Department’s Regulations.

D. Generation Lead Line. The proposed generator lead line is anticipated to produce a minor noise impact during operation.

E. Department Analysis. The Department’s independent noise expert, Peter Guldberg of Tech Environmental, assisted the Department in its review of potential noise impacts. Tech Environmental reviewed all of the materials submitted by the applicant and by members of the public.

Tech Environmental reviewed the original January 2012 Sound Level Assessment and submitted a Peer Review of the Sound Level Assessment, dated April 13, 2012 and May 1, 2012. Tech Environmental’s assessment is that the turbine maximum sound power level with a conservative total uncertainty factor was used in the analysis; the acoustic model and its

assumptions are appropriate; the sound receiver locations are appropriate; the decibel contour maps adequately cover the potential impact area; and the Department's Noise Regulations have been properly interpreted and applied by the applicant.

F. Post construction Monitoring Program. To ensure that the modeling and predictions submitted by the applicant and deemed reasonable by the Department correctly predicted sound levels, and that the project continues to meet the noise standards over time, the applicant must conduct post-construction sound level monitoring. The applicant proposed a monitoring program which was reviewed by the Department's noise expert, Peter Guldberg of Tech Environmental, Inc. Mr. Guldberg's review indicates that the monitoring plan appears acceptable given the low noise impact expected from this project.

G. Sound Complaint Response and Resolution Protocol. If noise limits are exceeded or are reasonably suspected to have been exceeded, the applicant proposes to perform a timely investigation to determine if the wind energy facility is properly operating or has been properly maintained, and determine if any applicable sound limits have been exceeded, including but not limited to the Department's interpretation and application of any tonal or SDRS penalties. If tonal sounds cause an exceedence of applicable sound limits, the applicant would promptly notify the Department. The applicant would expedite an investigation of the sound level exceedence and the associated tonal sound, and develop a mitigation plan and a schedule to achieve compliance with applicable sound level limits. The applicant would provide copies of the mitigation plan and provide a written report describing the action(s) taken and new measurement results that demonstrate compliance. Mitigation options could include reduction of the overall sound levels and/or the tonal sound component.

5. SCENIC CHARACTER:

In order to demonstrate that its proposal would have no unreasonable impact on scenic resources of state and/or national significance (SRSNS), the applicant submitted a visual impact assessment (VIA) for the proposed project prepared by Terrence J. DeWan and Associates (TJD&A), entitled *Visual Impacts of a Generation Facility*. The assessment examines the potential scenic impact of the generating facility and associated facilities on SRSNS within eight miles of the proposed project using the evaluation criteria contained in the Wind Energy Act. In addition, a user intercept survey authored by Market Decisions and dated October 2011 was submitted for evaluation by the applicant. The Department hired a third party expert, David Raphael of Landworks, to review the Scenic Character section of the applications. Mr. Raphael provided the Department with comments dated June 19, 2012.

The Wind Energy Act, 35-A M.R.S.A. § 3452 (1), provides in pertinent part that:

In making findings regarding the effect of an expedited wind energy development on scenic character and existing uses related to scenic character pursuant to ...[the Site Law,]Title 38, section 484, subsection 3 or [the Natural Resources Protection Act,]section 480-D, the

[Department] shall determine, in the manner provided in subsection 3, whether the development significantly compromises views from a scenic resource of state or national significance such that the development has an unreasonable adverse effect on the scenic character or existing uses related to scenic character . . . Except as otherwise provided in subsection 2, determination that a wind energy development fits harmoniously into the existing natural environment in terms of potential effects on scenic character and existing uses related to scenic character is not required for approval under...[the Site Law], Title 38, section 484, subsection 3.

With regard to the facilities associated with an expedited wind energy development, such as substations, buildings, access roads and generator lead lines, the Wind Energy Act, Title 35-A § 3452 (2), provides in pertinent part that:

The [Department] shall evaluate the effect of associated facilities of a wind energy development in terms of potential effects on scenic character and existing uses related to scenic character in accordance with ...[the Site Law,] Title 38, section 484, subsection 3, in the manner provided for development other than wind energy development if the [Department] determines that application of the standard subsection 1 to the development may result in unreasonable adverse effects due to the scope, scale, location or other characteristics of the associated facilities. An interested party may submit information regarding this determination to the [Department] for its consideration. The [Department] shall make a determination pursuant to this subsection within 30 days of its acceptance of the application as complete for processing.

The Wind Energy Act, Title 35-A § 3452 (3), further provides that:

A finding by the [Department] that the development's generating facilities are a highly visible feature in the landscape is not solely sufficient basis for determination that an expedited wind energy project has an unreasonable adverse effect on the scenic character and existing uses related to scenic character of a scenic resource of state or national significance. In making its determination under subsection 1, the [Department] shall consider insignificant the effects of portions of the development's generating facilities located more than 8 miles, measured horizontally, from a scenic resource of state or national significance.

The proposed wind project contains "generating facilities" including wind turbines and towers as defined by 35-A M.R.S.A. § 3451 (5) and "associated facilities" such as buildings, access roads, and substations, as defined by 35-A M.R.S.A. § 3451 (1). The proposed project is subject to the expedited wind energy development standards outlined above and, to the extent applicable, 38 M.R.S.A. § 484 (3). The project also contains a generator lead line which is replacing an existing line almost in its entirety.

As provided in the Wind Energy Act, 35-A M.R.S.A. § 3452 (2), the Department made a determination within 30 days of the receipt of the application that the potential effects of the generator lead transmission line on the scenic character and existing uses would be reviewed under the standards set forth in the Wind Energy Act and would not be reviewed under the Site Law or the Natural Resources Protection Act.

The applicant conducted a visual impact assessment within an eight-mile radius of the proposed generation facility portion of the project. The applicant's VIA for the generating facility and associated facilities addresses the following criteria, as set forth in 35-A § 3452(3):

- (A) The significance of the potentially affected scenic resource of state or national significance;
- (B) The existing character of the surrounding area;
- (C) The expectations of the typical viewer;
- (D) The expedited wind energy development's purpose and the context of the proposed activity;
- (E) The extent, nature, and duration of potentially affected public uses of the scenic resource of state or national significance and the potential effect of the generating facilities' presence on the public's continued use and enjoyment of the scenic resource of state or national significance; and
- (F) The scope and scale of the potential effect of views of the generating facilities on the scenic resource of state or national significance, including but not limited to issues related to the number and extent of turbines visible from the scenic resource of state or national significance, the distance from the scenic resource of state or national significance and the effect of prominent features of the development on the landscape.

A. APPLICANT'S STUDY

The applicant's study area is the area within eight miles of the project, as illustrated in Figure 2 in Appendix B of the application. The regional character is described by the existing landforms, water resources, vegetative patterns, and cultural character. The Study Area is a largely natural landscape with several areas of significant human alteration.

Landform. The Study Area is located in the Maine-New Brunswick Lowlands Subsection biophysical region, an extensive area of lowlands west of the St. Croix River. Elevations typically range from 400' to 600' except for a series of hills in the West Grand Lake area. The landscape to the south and west of the project area is generally flat to rolling, with relatively few hydrologic features. The landscape to the north and east is much more varied, with rolling to hilly terrain, extensive wetland systems, and numerous lakes and ponds with highly configured shorelines.

Two distinctive eskers are found at the edges of the Study Area. The Passadumkeag Esker, also known as the Enfield Horseback, parallels the east side of the Penobscot River. The second esker, known as The Horseback, is on the east side of Passadumkeag Mountain, extending north to the 1000-Acre Heath. Both eskers are heavily wooded with gravel roads running their length.

Passadumkeag Mountain is the most prominent landform in the Study Area, rising 1,200 feet above Saponac Pond. The main ridge is approximately 1.5 miles in length, which then extends easterly in a series of lower hills for another 2.7 miles. At its peak, Passadumkeag Mountain is 1,471 feet in elevation.

Water Resources. The Study Area contains 19 lakes and ponds, ranging in size from 5,165 acres (Nicatous Lake) to small unnamed ponds less than ten acres. Two ponds (Saponac Pond and Trout Pond) are located within three miles of the project. Nicatous Lake, 5.5 miles east of the project, is rated “Outstanding” for scenic character by the Maine Wildlands Lake Assessment (Assessment). Three of the lakes within the Study Area (Saponac Pond, Spring Lake, and Lower Pistol Lake) are rated as ‘Significant’ for scenic character by the Assessment. The Passadumkeag River drains the northern half of the Study Area, flowing for 41 miles west to its confluence with the Penobscot River. While most of its length is a relatively smooth meandering stream, the section above Grand Falls drops 25 feet in a significant waterfall. Saponac Pond, with a maximum depth of 14 feet, is a large shallow flowage in the Passadumkeag River. The Passadumkeag River has been rated as a ‘C’ river by the Maine Rivers Study. While the river is noted for its geologic-hydrologic, anadromous fishery, and canoe touring resources, it is not recognized for its scenic value in the Maine Rivers Study.

An extensive series of wetlands are found on the north side of Saponac Pond, extending from the town of Passadumkeag on the Penobscot River on the west to Upper Sysladobsis Lake on the east. This area, known as the Passadumkeag River – 1,000 Acre Heath, has been designated by the Maine Natural Areas Program as a “Focus Area.” Focus Areas are landscape areas that contain exceptionally rich concentrations of at-risk vegetation species, natural communities, and significant wildlife habitats, and they include the intersection of such places with large blocks of undeveloped habitat. These designated areas are intended as a planning tool for landowners, conservation entities, and local municipalities. Focus Areas are not designated as scenic areas of state or national significance by definition, but may otherwise qualify as such.

The Passadumkeag River – 1,000 Acre Heath Focus Area contains the 1000-Acre Heath in Twombly (T3 R1) and the 6,100-acre Passadumkeag Marsh and Boglands, a National Natural Landmark east of the town of Passadumkeag. At its closest point, the 1000-Acre Heath is over 8 miles northeast of the closest turbine. As noted below, at its closest point the Passadumkeag Marsh and Boglands is just 8 miles from the nearest turbine.

Vegetative Patterns. The predominant vegetative cover in the Study Area is a mixture of second growth forestland, freshwater wetlands, and old field growth. The vegetative patterns within the immediate area of the project are typical of forestland that has been commercially harvested over the past several generations.

Cultural Character. Cultural features within eight miles of the project are concentrated in and around the town of Burlington, 5.8 miles northwest of the project, and on the shores of the lakes to the east and southeast. Burlington, which had a population of 351 in the 2000 census, features a small village center with several historic buildings, including the Old Tavern, which is on the National Register of Historic Places. While there are no other population centers within the Study Area, there are a number of small named villages with a few related buildings scattered throughout: e.g., Lowell, East Lowell, Saponac, and Greenfield. Concentrations of lakeside cottages within the Study Area are found on Saponac Pond, West Lake, the northern end of Niatous Lake, Middle Oxhead Pond, and Brandy Pond. Scattered rural residential development is found along many of the local roads. The northwest end of Niatous Lake has several year-round resorts, with facilities for boating, fishing, ATV's, and seasonal lodging. Additional recreational development in the Study Area consists of boat landings on Niatous Lake, Saponac Pond, and West Lake; several informal campsites on Niatous Lake and Lower Pistol Lake; and a Boy Scout shelter on Niatous Lake. Passadumkeag Mountain was once considered for a ski area with an 800-foot vertical drop in the late 1990's, but the plans have not been implemented. A temporary meteorological tower erected by Passadumkeag Wind Park and a 574' lit communications tower used to broadcast WHCF-88.5 FM are the only structures on the mountain.

Scenic Resources of State or National Significance

1. A national natural landmark (NNL) is a federally designated wilderness area or other comparable outstanding natural and cultural feature, such as the Orono Bog or Meddybemps Heath.

According to the NNL website there is one National Natural Landmark within eight miles of the Passadumkeag Wind Project, the 6,100-acre Passadumkeag Marsh and Boglands that starts on the east side of the town of Passadumkeag. The southeast tip of the area designated as NNL touches the 8-mile line that circumscribes the Study Area. The National Park Service (NPS) website describes the Passadumkeag Marsh and Boglands NNL as: *One of the largest, unspoiled wetlands in the state of Maine, Passadumkeag Marsh and Boglands contains a unique blend of bog and marsh communities. The marsh is partially bounded by eskers, including the classic Passadumkeag Esker, or Enfield Horseback, known world-wide as an example of glacial geology.* The description of the Passadumkeag Marsh and Boglands from the Maine Department of Conservation notes that this particular NNL was owned by 13 private owners in 1973. According to the Maine Department of Conservation's *Conservation Lands in Maine* file for Google Earth, the Passadumkeag Marsh and Boglands are now part of the Cold Stream/Ayers Brook Preserve, which is a series of interconnected tracts of land held by The Nature Conservancy in fee. The area is open for public

use, although access is limited due to the nature of landscape. There are no developed trails and access by road is limited to small areas of frontage on Gould's Ridge Road and Enfield Road. Public use of the area is therefore limited primarily to canoeing and hunting waterfowl. The applicant concludes that the presence of the turbines should not have any visual impact on the Passadumkeag Marsh and Boglands. The applicant states that at most, the top of one turbine may be visible from the preserve and it would appear as a very small object on a relatively flat horizon.

2. A property listed on the National Register of Historic Places pursuant to the National Historic Preservation Act of 1966, as amended, such as the Rockland Breakwater Light and Fort Knox.

The National Register of Historic Places lists one property within eight miles of the Passadumkeag Wind Project, the Old Tavern in Burlington, built in 1844. The Tavern is a 2.5 story wooden frame structure with a gable roof, clapboard siding, and a veranda (covered porch) that wraps around the front façade. The National Register nomination form, submitted in 1986, describes the tavern as a popular headquarters for hunters and fishermen in the area in its later years. It was first built to serve as a hotel for lumber crews and others who were working in the area. The building sits on a corner lot in a small town setting. There is no mention made in the registration form about its relationship to the surrounding landscape. The setting is a classic cross-road village, with a church with a white-steeple across the street, and private residences, open fields/greens, and additional (formerly) commercial buildings nearby. The integrity of the immediate setting is important to the tavern. The applicant states that, even if the turbines were to be visible (which they are not), their relatively small size would not detract from the historic context. The building is 5.9 to 7.2 miles northwest of the project and separated by a dense stand of second growth vegetation. The primary function of the Tavern occurs inside the structure, and is not related to the scenic quality of the surrounding landscape. The applicant's field investigation has determined that the project would not be visible from the Tavern and the presence of the turbines should not have any visual impact on the Old Tavern.

3. A national or state park.

There are no national or state parks within eight miles of the project.

4. A great pond that is:

(a) One of the 66 great ponds located in the State's organized area identified as having outstanding or significant scenic quality in the "Maine's Finest Lakes" study; or

(b) One of the 280 great ponds in the State's unorganized or de-organized areas designated as outstanding or significant from a scenic perspective in the "Maine Wildlands Lakes Assessment".

No great ponds listed in the "Maine's Finest Lakes" study are involved. The scenic resources of three great ponds within eight miles of the project have been designated as significant in the Maine Wildlands Lakes Assessment (Assessment): Saponac Pond, Spring Lake, and Lower Pistol Lake. One great pond within the Study Area, Nicaous Lake, has been designated as outstanding from a scenic perspective in the Assessment.

SAPONAC POND

Saponac Pond (922 acres, elevation 190 feet above sea level) is two miles east of Burlington on Route 188 (Main Road). The pond is the second largest waterbody in the Study Area and the closest SRSNS. The northern third of the pond is located in Burlington; the southern portion is located in Grand Falls Township. Most of the shoreline is either private timberland or developed for house lots. The entire pond is within eight miles of the project. The landscape within two miles of the pond consists of gently rolling wooded hills that are drained by boggy meandering streams and rivers. Folsom Ridge, on the northeast side of Route 188, rises approximately 300 feet above the level of the pond. The most distinctive landform in the vicinity is Passadumkeag Mountain, a broad U-shaped series of ridges to the south that rise over 1,250 feet above the pond.

The applicant's VIA concludes that based on the survey results, photo-simulation, viewshed maps, and roadway plans, the turbines, seen in profile on the ridgeline of Passadumkeag Mountain, and portions of the access road would have an adverse effect on the scenic value of Saponac Pond. The pond apparently sees relatively few recreational users; the users are primarily there for fishing and boating. The results of the user intercept survey indicate that most people will continue to return to the lake to enjoy boating, fishing, and similar recreational pursuits even with turbines in view.

NICATOUS LAKE

Nicaous Lake (5,165 acres, elevation 347 feet above sea level) is the largest waterbody within eight miles of the project, although the most of the lake is outside the 8-mile Study Area. The lake is located southeast of Passadumkeag Mountain in T4 ND, T40 MD, and T 41 MD. Most of the shoreline (with the exception of several sporting camps and private homes) is privately owned with conservation easements held by the Maine Bureau of Parks and Lands (BPL); most of the islands in the lake are owned in fee by BPL. Nicaous Lake is a narrow waterbody approximately nine miles in length with a highly configured

shoreline surrounded by low rolling hills. The northern third of the lake, which falls within eight miles of the project, is between 0.2 and 0.9 miles in width, significantly narrower than the southern portion. The axis of the northern portion generally runs northwest/southeast, although the islands make it difficult to achieve a long view except along the western shoreline. The closest turbine in the project is located 5.6 miles west of this portion of the lake. The landforms surrounding the northern end of the lake rise up to 150 to 225 feet above the surface of the water. One of the most noteworthy features of Nicasious Lake is the number of wooded islands found throughout its length. The islands, in combination with the surrounding hills, are effective in limiting turbine visibility within the Study Area. There are no named mountains or other distinctive focal points within the foreground or midground in this portion of the lake.

The applicant's VIA states that based on the survey results, photo-simulation, and the viewshed maps, the project would have an adverse effect on the scenic value of the northern third of Nicasious Lake, which is recognized for its outstanding scenic resources. However, there are several moderating factors that affect the overall scenic impact. The distance of the project (5 to 8 miles) from the lake would make the turbines appear as relatively small to medium-sized objects on the horizon and the low hills and wooded islands between the project and the viewer would provide intermittent screening so the entire project would never be visible from any one point on the lake. According to the user survey, most people would continue to return to the lake for boating, fishing, and similar recreational pursuits even with turbines in view.

LOWER PISTOL LAKE

Lower Pistol Lake (979 acres, elevation 323 feet above sea level) is in T3 ND, ten miles east of Burlington and between 4.9 and 6.2 miles from the project. The majority of the land surrounding the lake is part of the Passamaquoddy Indian Territory. Lower Pistol Lake is the westernmost waterbody in a chain of lakes that includes Upper, Middle, and Side Pistol Lakes and Spring Lake. The landscape surrounding the lake consists of gently rolling wooded hills that are drained by boggy meandering streams. An unnamed hill to the southwest rises 300 feet above the lake. Logging operations have created a network of woods roads that approach the lake from Pistol Green, a break in a distinct esker two miles west of the lake. Access to the lake is over very rough woods roads. An informal boat put-in and campsite is located in an opening at the northwestern end of the lake. The lake appears to be undeveloped, with no camps evident from field evaluation or aerial photographs. The Maine Atlas and Gazetteer locates an informal campsite on one of the islands in the middle of the lake.

The applicant's VIA states that based on the survey results, photo-simulation, and the viewshed maps indicate that the turbines, seen in profile on the ridgeline of

Passadumkeag Mountain, would have an adverse effect on the scenic value of Lower Pistol Lake. However, there are several moderating factors that affect the overall scenic impact. The project would be visible in the background, which would make the turbines appear as relatively small to medium-sized objects on the horizon. According to the user survey, the majority of the small number of users of the lake would continue to return to the lake to enjoy boating, fishing, and similar recreational pursuits even with turbines in view.

SPRING LAKE

Spring Lake (435 acres, elevation 336 feet above sea level) is in T3 ND, ten miles east of Burlington and between 4.9 and 6.2 miles from the project. Spring Lake is the westernmost waterbody in a series of lakes that includes Lower, Upper, Middle, and Side Pistol Lakes. The landscape surrounding the lake consists of gently rolling wooded hills rising 200± feet above the lake, interconnected by boggy meandering streams. A small solitary island is found at the southern end, near the put-in point. Logging operations have created a discontinuous network of woods roads that approach the lake from Pistol Green on the west. Access is over a very rough woods road on the south side of the lake, where there is an informal hand-carry put-in. The lake appears to be largely undeveloped, with only one camp evident from field evaluation or aerial photographs.

The applicant's VIA states that based on the photo-simulation, viewshed maps, and field investigation indicate that the blades and tips of four turbines would be scarcely visible from Spring Lake, and therefore would have a very slight adverse effect on the scenic value of the lake.

WEST LAKE

A comprehensive visual analysis was not conducted by the applicant for West Lake, as it is not listed as significant or outstanding in the Assessment. Nonetheless, it is clear that there would be visual impacts to West Lake, which has a large number of camps. Camp orientation on each of the extensive southwest and northeast facing shorelines is not, for the most part, in the direction of the project. The intervening vegetation and topography, coupled with the distance from project (5 miles to the nearest turbine at the closest point of visibility from the lake), would limit overall visual impact. Owners on the north shore would not be able to see the project.

5. A segment of a scenic river or stream identified as having unique or outstanding scenic attributes listed in Appendix G of the "Maine Rivers Study."

There are no rivers or streams identified in the Maine Rivers Study as having unique or outstanding scenic attributes within eight miles of the proposed project.

6. A scenic viewpoint located on state public reserved land or on a trail that is used exclusively for pedestrian use, such as the Appalachian Trail, that the Department of Conservation designates by rule, adopted in accordance with Title 35-A section 3457 of the Wind Energy Act.

There are no scenic viewpoints located on state public reserved land within eight miles of the proposed project. There are no trails exclusively for pedestrian use within eight miles of the proposed project.

7. A scenic turnout on a scenic highway constructed by the Department of Transportation.

There are no scenic turnouts on any designated scenic highways constructed by the Department of Transportation within eight miles of the proposed project.

8. Scenic viewpoints located in the coastal area.

There are no scenic viewpoints located in coastal areas within 8 miles of the proposed project.

B. DEPARTMENT REVIEW

David Raphael of Landworks, the Department's consultant, ranked six resources in his review document entitled 'Summary of Overall Scenic Impact'. The six resources were evaluated based on the statutory requirements of context, character significance, uniqueness, level of use, viewer expectations, visual impact and effect on public use. Additionally, they were evaluated for proximity, distance from the project, duration and extent of the views and visual absorption. Each criterion is rated, in an evaluation matrix, for a maximum point value of three, which is equal to high potential impact on the resource, down to zero, which indicates no potential impact on the resource.

In addition to the matrix evaluation, Mr. Raphael provided the following comments to the Department on the six scenic or historic resources within the 8 mile study area radius;

1. Passadumkeag marsh and bog lands, a historic natural landmark

Only a very small portion of this area, 0.6 acres (the most southeasterly section of the bog land parcel) is within the 8 mile radius. Based on the viewshed analysis of both the applicant's VIA and the Landworks analysis of aerial photography for land cover, it is expected that there would be no visibility of the project from this resource.

2. Old Tavern in Burlington, on the national historic register

The tavern faces Main Road and is oriented in a manner that the view of its external architectural qualities as well as access to the building's interior is from the west. From this direction the project would not be visible. Any potential views of the project would be in the southerly to south easterly direction. It appears as though the western end of Passadumkeag Mountain is potentially visible along the road corridor, but it is most likely a portion of the mountain for which turbines are not proposed. The tavern is surrounded to the south by mature trees and other structures through which views of the project could be possible but for the most part only in winter. It is unlikely that these views are possible, however, due to the intervening vegetation and structures.

3. Saponac Pond located in the Burlington and Great Falls Township area, rated as significant by the Assessment

Saponac Pond is recognized for its bass and perch fishery, and has been developed with camps primarily along its northeastern and northwestern shores. There are up to 50 camps and year-round homes on the shores or in the vicinity of the pond. The pond shoreline is wooded with hardwoods and softwoods with the exception of clearing for camps and the short section where Route 188 Main Rd. follows the shoreline. Located short distances beyond the southern shoreline are openings in the forest cover as result of logging activity.

From Route 188 Main Rd., the closest turbines would be at a distance of between 4 and 4.8 miles; from the South Shore of Saponac Pond the closest turbine would be at a distance of 2.3 miles. Saponac Pond, due to its proximity to the project site and the fact that there would be visibility of the project from nearly all of the surface area of the pond, would be adversely impacted by this project. Many users who are boating or fishing on the lake would have the project potentially in view, with some exceptions due to the north facing shorelines that would benefit from vegetative screening. There is currently what is considered to be some inharmonious development as identified in the rating set forth in the publication "Scenic Lake Character Evaluation in Maine's Unorganized Towns", but the overall scenic rating may be attributable to the presence and prominence of the Passadumkeag Mountain itself. Saponac Pond is by no means a pristine water body, and the logging activity and existing mountaintop development with roads and radio towers contributes to the sense of the pond being in a developed area that has been used historically as a working landscape.

From Saponac Pond the turbine array would be readily visible against the backdrop of sky and atmosphere. Given the horizontal extent of the project and the fact that it would be visible from most of the lake and that the view would comprise anywhere from 31° of the panorama at the simulation site up to 62° in the middle of the lake, this project would dominate the views that many users

would experience. The project would change the mountain landscape with clearings for the turbine pads and the service roads that would connect the turbine sites. It would add a distinct and unnatural form to this mountain landscape. The key question is whether the project visibility would greatly diminish the use and enjoyment of the primary user group on the water.

The user survey results indicate that 59% of people surveyed indicate that if the project were built it would not change their sense of enjoyment; 41% indicated it would have a negative impact. Additionally, a number of users indicated that, for several different recreational activities such as swimming, boating, canoeing, kayaking, and ice fishing they would still be likely to return to the pond for those activities. Almost 3/4 of those surveyed (71 to 74%) indicated that they would still be likely to return to the pond to recreate after the project is developed.

Landworks concluded that this project would most definitely result in an adverse impact to the scenic quality of Saponac Pond. While the project would not directly affect the physical form and character of the pond itself, the project would be prominent and alter the visual quality and sense of place for the users and camp owners. There are mitigating factors however and these include:

1. The fact that the area already has been developed and the mountain environments are not pristine,
2. The relative high number of respondents who indicated the project would not have a substantial impact on enjoyment and their willingness to return; and
3. The result of the evaluation matrix, which takes into account a range of factors, yields a rating of 2.1, indicating a moderate impact to scenic quality.

4. Niatous Lake located in T-3 MD and T 40 MD Hancock County, rated as outstanding by the Assessment.

Approximately 1/2 of this 9 mile long lake is within the project's 8 mile view shed. The applicant's VIA indicates that the visibility of the project would be limited on the lake. Any visibility would be of only a few turbines in a narrow angle of view of approximately 10.2° when compared to an overall 360° panorama. Turbines range in distance from between 6.9 miles for the distance of the closest visible turbine and 9.5 miles for the distance of the most distant visible turbines from the simulation view location. The developed area at the northern end of the lake and Porter Cove is unlikely to have any visibility of the turbines due to the intervening vegetation and topography. Additionally the view shed analysis undertaken by both the applicant's visual consultant and Landworks indicates limited visibility of the project from points on the lake which are within the eight mile project radius. The distance to the nearest visible turbine is such

that these turbines would be neither dominant nor serve as a focal point to draw the eye.

Passadumkeag Mountain can be discerned from viewing points within the broad lake area and beyond the 8 mile project radius but one needs to be looking for it, as it appears as a distant land form just above the tree line. Atmospheric conditions and landscape qualities associated with the lake and shoreline would diminish the presence of the project both within and beyond the 8 mile radius, lessening the potential effects on the user with regard to visual impact. The wind project, if built, has the potential to result in adverse impact of the scenic qualities and values present on the lake. The visibility of the project is limited by distance, but would still add in an unnatural element to the view and horizontal line when and if seen from the shoreline or on the lake vantage points. Any change in the view and the sense that there is a major, utility scale wind project in the distance would affect the user sense of landscape and scenery in a potentially negative manner. This is sufficient to conclude that the project would have some adverse effects but the extent of the visibility of the project on the horizon is limited overall and the visibility in many portions of the lake would be limited or nonexistent. In the user survey 68% of the respondents indicated that the project would not change, or would have a positive impact, on their level of enjoyment. The scale of the project's potential visual presence is not so large as to be disconcerting and unsettling. The evaluation matrix indicates that the project's impact on scenic qualities and values would be moderate, attaining a composite rating of 1.9.

5. Lower Pistol Lake located on Passamaquoddy Trust Lands, Hancock County, rated as significant by the Assessment.

The general context for this particular lake is one of an undeveloped, remote pond however there is evidence of surrounding timber harvesting and forest resource management. With the surrounding low relief of this pond and the wooded nature of the shoreline this area is not particularly unique nor does it rise to the level of being distinctive with regard to other similar lakes in the region. The lake is considered generally remote as it is only reachable by four-wheel drive or in the winter by snowmobile. The distance to the nearest turbine from this lake is over 5 miles at the northern end of the lake. On those portions of the lake where the turbines are visible, the range of view is approximately 8.5° when compared to an overall 360° panorama.

In the user survey 62% of respondents indicated that their enjoyment of the pond would not be affected by the turbines.

This project would be visible from portions of lake with the presence of turbines in the distance and thus would result in an adverse impact on the scenic quality of

this lake. This would not be a substantial change to the experience of an unfettered, undeveloped lake. There is a limited extent of potential project visibility on this lake, a small percentage of the panorama would be occupied by the project and it would not impact the quiet and solitude that the lake provides. This is supported by the results of the evaluation matrix which, when the various impacts were rated, resulted in a 1.4 rating which is between low and moderate impact.

6. Spring Lake located in T-3 NDE Hancock County rated as significant by the Assessment.

Spring Lake is another seemingly remote, undeveloped pond but it is surrounded by both wetland systems and timber harvest operations. The shoreline is wooded with spruce, pine and northern hardwoods, and much like Lower Pistol Lake the topography around the lakes is comprised of low lands and low ridges with elevation differences of about 200 to 250 feet above the lake surface. The lake is primarily accessible with four-wheel drive or in the winter by snowmobiles. When topography and vegetation is taken into account, the view shed analysis yields the conclusion that only a small portion of the lake, approximately 15% of the surface and shoreline area, would have visibility of the proposed project turbines from hub height and above.

The visual impacts to Spring Lake resulting from this project would be minimal, if discerned at all. Users would need to be, for the most part, looking in the right direction and would need to know what they're looking for in order to see the project. There were no specific user survey results for Spring Lake other than two people surveyed indicated that they have visited the lake. Given the distance to the project, the minimal visibility, the lack of users and difficult access, as well as the fact that the lake is not an outstanding scenic landscape, it appears that the project's impacts would barely be adverse and the overall impact to scenic quality would be low. The findings of the evaluation matrix yielded a score of 1.1 and confirm this conclusion.

C. NIGHT SKY IMPACTS

Some members of the public raised concern over the visual impacts from the warning lights required by the Federal Aviation Administration that would be placed on the top of some turbines. An interested person submitted a photograph of another wind power project in the state which showed the reflection of such lights on a lake. The Department acknowledges that there may be some light reflected on the lake surface under rare occasions, however the FAA lights are required and such a requirement factors into the reasonableness of the impacts to scenic quality.

Although there are some adverse effects on the scenic character of scenic resources of state or national significance, under the provisions of the Wind Energy Act, the Department must determine whether a project significantly compromises the view from SRSNS and that the project unreasonably affects the continued use and enjoyment of the SRSNS. The Wind Energy Act provides that an applicant need not demonstrate that a project fit harmoniously into the existing natural environment, however, a proposed project must not have an unreasonable effect on the existing character or uses related to scenic character. This determination is made utilizing the factors listed in Title 35-A § 3451(3A-F) above. Based on the Department's review of the VIA and user surveys, it appears that the project would not have an unreasonable adverse impact on any SRSNS or unreasonable adverse effect on the continued use of the SRSNS by a typical user.

6. WILDLIFE AND FISHERIES:

The applicant submitted the results of a series of ecological field surveys conducted by Stantec Consulting (Stantec), including wildlife surveys; wetland delineations; rare, threatened, and endangered plant and animal species surveys; and vernal pool surveys within the project area, including the area affected by the 13 mile generation lead line. During the preparation of the surveys and other material in support of the application, Stantec consulted with the Department and other natural resource review agencies.

A. Significant Vernal Pools. Stantec conducted vernal pool surveys within the project area in the spring of 2011. Stantec identified one vernal pool within the transmission line portion of the project area which would be being impacted by clearing. The clearing would impact less than 25% of the critical terrestrial habitat of the vernal pool and those impacts have been approved under PBR #53622.

B. Inland Waterfowl and Wading Bird Habitat. The turbine portion of the project would not impact any Inland Waterfowl and Wading Bird Habitat (IWWH).

The proposed collection line would cross three sections of IWWH. Two of the crossings resulted in an increase of more than 10% of the developed area and result in a total impact of 9,800 square feet adjacent to existing cleared area and a road. The applicant proposes to construct the transmission line to be compliant with the U.S Fish and Wildlife Department's Avian Protection Plan (APP) Guidelines. This would include cutting only vegetation that could grow to within 15 feet of a conductor in the next three to four years. If possible the applicant would leave two to three snags within the transmission corridor to provide nesting habitat. The applicant would also locate poles in upland areas whenever possible in order to minimize impacts to the IWWHs. The Department's analysis is that the impacts to IWWHs would be minimized by the proposed vegetation management plan and the effort to locate poles in upland areas.

The impacts to a third area of IWWH, which result in an increase of less than 10% of the developed area, meet the standards of Chapter 305 Permit by Rule Standards and are permitted under PBR #53671.

C. Deer Wintering Area. Neither the turbine nor transmission line portions of the project would impact any Deer Wintering Areas as defined under the Natural Resources Protection Act.

D. Rare, Threatened, and Endangered Species. Stantec conducted a survey of the area within two miles of the project for plant and animal species that are state or federally listed as Rare, Threatened, and Endangered. No Rare, Threatened or Endangered plant or animal species were found.

E. Salmon Habitat Streams. The project as proposed would not impact any locations of Critical Habitat for Atlantic Salmon as defined by the Department of Marine Resources.

F. Birds and Bats. The applicant retained Stantec to conduct bird and bat surveys to identify which species occurred in the area of the proposed project, the extent of the use of the site by such species, and potential impacts of the proposed project. Stantec conducted specific avian surveys including raptor migration surveys and eagle use surveys. It also compiled a list of bird species observed on the site. In the spring of 2011, Stantec conducted 20 nights of nocturnal radar, acoustic bat and raptor migration surveys. In the summer of 2011, breeding bird surveys were done. In the fall of 2011, 12 days of raptor surveys were conducted. In addition to the fall surveys, 12 survey days were conducted in late August/early September and mid-October/early November to document eagle activity and migration.

The majority of the bat calls identified were in the *Hoary* bat family (957 out of 1133 calls) followed by unknown calls (76 out of 1133), and *Myotis* species (48 out of 1133). A total of 171 observations of raptors were documented. Three Bald Eagles were observed.

MDIFW recommends that, to minimize potential impacts to bat species found at the project site, operational control measures should be established for the proposed project. MDIFW recommends that the applicant be required to curtail the cut-in speed for all turbines to 5.0 meters/second (m/s) between April 20 and October 15 from one-half hour before sunset to one-half hour after sunrise. Under this recommendation, during times when the winds are less than the 5.0 m/s threshold, turbine blades would not rotate, thus reducing risk of fatality for bats. If at any point during this time period the wind speed increases to greater than 5.0 m/s, the turbine blades would be free to rotate. These curtailment measures are intended to be in place from day one of operation for the life of the project.

After consultation with MDIFW regarding curtailment and the potential for bat mortality, the applicant agreed to seasonal curtailment of the turbine cut-in speed to 5.0 m/s on all turbines starting one half hour before sunset to one-half hour after sunrise for the life of the project. The applicant proposes that this curtailment be required from May 1 to September 30, and only when the ambient temperature is above 50 degrees F from June 1 to August 31, and when above 32 degrees F in May and September. If at any point during this time period the

wind speed increases to >5.0 m/s the turbine blades would be free to rotate. MDIFW has commented that this level of curtailment would be adequate.

Regarding post-construction monitoring of bird and bat mortality, MDIFW further stated that assuming an April 20 to October 15 search window, MDIFW would consider it adequate for searches to take place weekly between April 20 and May 31 and daily between June 1 and September 30, with a return to a weekly schedule from October 1 through October 15. The applicant responded that because post-construction monitoring at wind power projects is an evolving science, they will work with MDIFW to finalize a monitoring methodology prior to the start of operation. MDIFW agreed to work with the applicant to develop a final monitoring methodology.

No fisheries impacts are anticipated from the proposed project.

The project should not result in an unreasonable impact on fisheries and wildlife provided turbine operation is curtailed as outlined above. If post construction monitoring indicates an unreasonable impact on birds, bats and raptors, the Department, in conjunction with MDIFW, maintains the ability to modify operation of the wind project as necessary. Post construction monitoring at other operating wind projects in Maine has not indicated any unreasonable impact on birds and raptors.

7. HISTORIC SITES AND UNUSUAL NATURAL AREAS:

The Maine Historic Preservation Commission reviewed the proposed project and stated that it will have no effect upon any structure or site of historic, architectural, or archaeological significance as defined by the National Historic Preservation Act of 1966.

The Maine Natural Areas Program database does not contain any records documenting the existence of rare or unique botanical features on the project site and, as discussed in Section 6, MDIFW did not identify any unusual wildlife habitats located on the project site.

8. SOILS:

The applicant submitted a soil survey map and report and a geotechnical report based on the soils found at the project site. This report was prepared by a certified soils scientist and reviewed by staff from the Department's Division of Environmental Assessment of the Bureau of Land and Water Quality (DEA). DEA also reviewed the applicant's Blasting Plan (dated February 2012) which outlines the proposed procedures for removing rock and ledge.

Based on this review, it appears the project site presents no limitations to the proposed project that cannot be overcome through standard engineering practices.

9. STORMWATER MANAGEMENT:

The proposed project includes approximately 21.47 acres of impervious area and 97.38 acres of developed area. It lies within the watersheds of the Passadumkeag River, Saponac Pond and Great Pond. The applicant submitted a stormwater management plan based on the basic, general, phosphorus, and flooding standards contained in Department Rules, Chapter 500. The proposed stormwater management system consists of vegetated buffers for the turbine site and underdrained soil filters at the O&M building.

A. Basic Standards:

(1) Erosion and Sedimentation Control: The applicant submitted an Erosion and Sedimentation Control Plan (Section 14 of the application) that is based on the performance standards contained in Appendix A of Chapter 500 and the Best Management Practices outlined in the Maine Erosion and Sediment Control BMPs, which were developed by the Department. This plan and plan sheets containing erosion control details were reviewed by, and revised in response to the comments of, the Division of Watershed Management (DWM) of the Bureau of Land and Water Quality.

(2) Inspection and Maintenance: The applicant submitted a maintenance plan that addresses both short and long-term maintenance requirements. This plan was reviewed by, and revised in response to the comments of, DWM. The maintenance plan is based on the standards contained in Appendix B of Chapter 500. The applicant would be responsible for the maintenance of all common facilities including the stormwater management system.

B. General and Phosphorus Standards: The General Standards must be met for the portion of the project which drains to the Passadumkeag River.

The applicant's stormwater management plan includes general treatment measures that will mitigate for the increased frequency and duration of channel erosive flows due to runoff from smaller storms, provide for effective treatment of pollutants in stormwater, and mitigate potential temperature impacts. The proposed portion of the project which drains to the Passadumkeag River is a road and meets the definition of "a linear portion of a project" in Chapter 500. For that area, the applicant is proposing to control runoff volume from no less than 75% of the impervious area and no less than 50% of the developed area

The forested, no disturbance stormwater buffers are proposed to be protected from alteration through the execution of a deed restriction. The applicant proposes to use the deed restriction language contained in Appendix G of Chapter 500.

The portions of the project which drain to Saponac Pond and Great Pond are required to meet the Phosphorus Standards.

Because of the proposed project's location in the watersheds of Saponac Pond and Great Pond, the applicant proposes to treat stormwater runoff from the project site to meet the phosphorus standard outlined in Chapter 500(4)(C). The applicant's phosphorus control plan was developed using methodology developed by the Department and outlined in "Phosphorus Control in Lake Watersheds: A Technical Guide for Evaluating New Development". For this project, the Permitted Phosphorus Export is 18.0123 pounds of phosphorus per year for Saponac Pond and 7.0650 pounds of phosphorus per year for Great Pond. The applicant proposes to remove phosphorus from the project's stormwater runoff by utilizing buffers and underdrained soil filters, as shown on the set of plans referenced in Finding 1. The predicted phosphorus export for the project site based on the applicant's model is 17.8462 pounds per year of phosphorus for Saponac Pond and 7.0626 pounds per year of phosphorus for Great Pond. The proposed stormwater treatment should be able to reduce the export of phosphorus in the stormwater runoff below the maximum permitted phosphorus export for the site.

C. Flooding Standard:

The applicant is proposing to utilize a stormwater management system based on estimates of pre- and post-development stormwater runoff flows obtained by using Hydrocad, a stormwater modeling software that utilizes the methodologies outlined in Technical Releases #55 and #20, U.S.D.A., Soil Conservation Service and retains stormwater from 24-hour storms of 2-, 10-, and 25-year frequency. Based on the analysis and the Department's experience with it, the post-development peak flow from the site is not expected to exceed the pre-development peak flow from the site and the peak flow of the receiving waters would not be increased as a result of stormwater runoff from the development site.

DWM commented that the proposed system is designed in accordance with the Chapter 500 Basic, General, Phosphorus and Flooding Standards.

11. GROUNDWATER:

The project site is not located over a mapped sand and gravel aquifer. The proposed project does not propose any withdrawal from, or discharge to (except for a single septic system described in Finding 13) the groundwater.

12. WATER SUPPLY:

Water for the development would be supplied by an individual well at the O&M building. The applicant submitted an assessment of groundwater supplies that are available on the project site. This assessment was prepared by a certified geologist and was reviewed by, and revised in response to comments from, the BLWQ's Division of Environmental Assessment (DEA).

The applicant's revised assessment indicates that there would be adequate provision for securing and maintaining a sufficient and healthful water supply.

13. WASTEWATER DISPOSAL:

Wastewater would be disposed of by an individual subsurface wastewater disposal system located at the O&M building. The applicant submitted the soil survey map and report discussed in Section 11. The individual system would be required to be designed to meet the requirements of the Maine State Plumbing Code. Based on a review of the information submitted by DEA, it appears that a subsurface wastewater disposal system capable of handling septic waste from the O&M building can be constructed on this site.

14. SOLID WASTE:

When completed, the proposed project would be anticipated to generate minor amounts of general solid waste per year. All general solid wastes from the proposed project would be disposed of at Penobscot Energy Recovery Company (PERC), which is currently in substantial compliance with the Maine Solid Waste Management Rules.

All marketable timber will be removed from the project site. A single 1 acre stump dump may be located on the parcel. All stumps and grubblings generated will be disposed of on site, either chipped or burned, with the remainder to be worked into the soil, in compliance with the Maine Solid Waste Management Rules.

The proposed project would generate approximately 465 cubic yards of construction debris and demolition debris. All construction and demolition debris generated will be disposed of at Juniper Ridge which is currently in substantial compliance with the Maine Solid Waste Management Rules.

15. FLOODING:

The proposed project is not located within the 100-year floodway of any river or stream.

16. WETLAND IMPACTS:

The applicant retained Stantec Consulting to locate wetlands and waterbody resources on the proposed project site. The results of the applicant's surveys for wetlands and waterbodies which may be affected by the turbine sites, access roads and collector lines are summarized as follows:

- 173 wetlands were identified along the proposed access roads and the electrical collector line.
- 35 jurisdictional streams were identified, including 23 perennial streams. No streams are proposed to be crossed;

- 67 vernal pools were identified, including 3 significant vernal pools, and 4 potentially significant vernal pools, only one of which would be impacted, as discussed in Section 7.
- 34 wetlands were identified that meet the definition of wetlands of special significance.

Freshwater Wetland Impacts.

The applicant is proposing 1.2 acres of vegetation conversion in wetland areas for the turbine sites, access roads and collector lines. No permanent loss of freshwater wetland through filling is proposed.

The Department's Wetlands and Waterbodies Protection Rules, Chapter 310, provide the framework for the Department's analysis of whether a proposed project's impacts to the protected resources would be unreasonable as that term is used in the NRPA, and whether the project meets the NRPA licensing criteria. A proposed project's impacts may be found to be unreasonable if the project would cause a loss in wetland area, functions and values for which there is a practicable alternative that would be less damaging to the environment. For this aspect of the Department's review an applicant must provide an analysis of alternatives to the project.

A. Avoidance. The applicant submitted an alternatives analysis for the wetland and stream impacts of the proposed project completed by Stantec Consulting dated February 2012. The applicant states that the proposed project was designed to avoid wetlands to the greatest extent possible and the applicant proposes to site the proposed turbines and associated access roads in predominantly upland areas. The applicant used existing roads when possible to avoid any new impacts to natural resources. Any new roads that were necessary were designed to avoid wetlands if practical. The construction and maintenance of the electrical transmission line would primarily result in a permanent change in vegetation cover type in wetland areas.

B. Minimal Alteration. In the determination of whether any adverse impacts from a project are unreasonable, the Department looks at whether the amount of wetland and waterbodies to be altered have been kept to the minimum amount necessary for meeting the overall purpose of the project. The applicant is proposing construction practices to reduce erosion, maintain stream and vernal pool buffers and reduce habitat fragmentation by the proposed co-locating of the majority of the generator lead transmission line.

C. Compensation. Compensation may be required to achieve the goal of no net loss of wetland functions and values. The applicant submitted an assessment of the functions and values of wetlands impacted by the proposed project prepared by Stantec. The assessment determined that the primary functions and values of the impacted wetlands were wildlife habitat, with some levels of floodwater alteration, sediment/toxicant retention, and production export. In this case, it

appears that the conversion of the vegetative cover type in wetlands affected by the project will not result in a loss of functions and values so compensation should not be required.

The applicant's design of its proposed roads and turbines avoided any wetland impacts. The transmission line minimized wetland impacts, resulting in just 1.2 acres of impacts, all of which are vegetation changes. No wetland would be lost due to filling. The Department considers whether the proposal is the least environmentally damaging alternative that meets the overall purpose of the project. The proposed project has siting restraints in terms of alternatives due to the need to locate in an area of appropriate wind and outside of major residential areas.

17. SHADOW FLICKER:

In accordance with 38 M.R.S.A. § 484 (10), an applicant must demonstrate that the proposed wind energy development has been designed to avoid unreasonable adverse shadow flicker effects. Shadow flicker caused by wind turbines is defined as alternating changes in light intensity caused by the moving blade casting shadows on the ground and stationary objects. Shadow flicker is the sun seen through a rotating wind turbine rotor. Shadow flicker does not occur when the sun is obscured by clouds or fog or when the turbine is not rotating. The spatial relationships between a wind turbine and receptor, as well as wind direction which cause the turbines to rotate, are key factors relating to shadow flicker occurrence and duration. At distances of greater than 1,000 feet between wind turbines and receptors, shadow flicker usually occurs when the rotor plane is in-line with the sun and receptor (as seen from the receptor), the cast shadows would be very narrow (blade thickness) and of low intensity, and the shadows would move quickly past the stationary receptor. When the rotor plane is perpendicular to the sun-receptor "view line," the cast shadow of the blades would move within a circle equal to the turbine rotor diameter.

The applicant submitted a shadow flicker analysis with its application. The applicant used WindPRO, a wind modeling software program, to model expected shadow flicker effects on adjacent properties from the 14 proposed turbine locations. The applicant assumed a worst case scenario, that all receptors have a direct in-line view of the incoming shadow flicker sunlight, and did not take into account any existing vegetative buffers.

The Department generally recommends that an applicant conduct a shadow flicker model out to a distance of 1,000 feet or greater from a residential structure, and the applicant's model did so. The applicant modeled two receptors, A and B, which are located within 1 mile of the project and which would potentially receive shadow flicker. Maine currently has no numerical regulatory limits on exposure to shadow flicker, however, the industry commonly uses 30 hours per year as a limit to reduce nuisance complaints. Receptor A would have approximately 46.54 hours of flicker per year and receptor B would have

approximately 4.37 hours per year. The applicant has a lease agreement with Receptor A allowing shadow flicker greater than 30 hours per year. Based on the WindPRO analysis, there are no other receptors within one mile of the project.

The shadow flicker modeling conducted by the applicant is credible. The proposed project would cause only limited shadow flicker to occur over one receptor, Receptor B, which is not subject to an easement allowing for shadow flicker.

18. PUBLIC SAFETY:

The proposed project would use Vestas V-112 3.0-megawatt (MW) wind turbine generators. The turbines' conformity with International Electrotechnical Commission standards has been certified by Det Norske Veritas and included in the applications in Appendix 27-2 dated March 19, 2010.

The Department recognizes that locating wind turbines a safe distance away from any occupied structures, public roads or other public use areas is extremely important. In establishing a recommended safety setback, the Department considered industry standards for wind energy production in climates similar to Maine, as well as the guidelines recommended by certifying agencies such as Det Norske Veritas. Based on these sources, the Department requires that all wind turbines be set back from the property line, occupied structures or public areas a minimum of 1.5 times the maximum blade height for the wind turbine. Based on the Department setback specifications, the minimum setback distance to the nearest property line should be 688.5 feet for the Vestas turbines. A review of the application indicates that all turbines are setback at least 688.5 from occupied structures and public areas.

19. DECOMMISSIONING PLAN:

In order to facilitate and ensure appropriate removal of the wind generation equipment when it reaches the end of its useful life or if the applicant ceases operation of the turbines, the Department requires an applicant to demonstrate, in the form of a decommissioning plan, the means by which decommissioning would be accomplished. The applicant's decommissioning plan includes a description of the trigger for implementing the decommissioning, a description of work required, an estimate of decommissioning costs, a schedule for contributions to its decommissioning fund and a demonstration of financial assurance.

A. Trigger for implementation of decommissioning. The proposed wind turbine generators are designed and certified by independent agencies for a minimum expected operational life of 20 years, however other factors may also trigger the requirement for decommissioning. The applicant's proposal is that the wind generation facility would be decommissioned when it ceases to generate electricity for a continuous period of twelve months. In the case of a force majeure event which is the cause of the project not generating electricity for 12 months, the applicant proposes that it be allowed to submit to

the Department for review and approval reasonable evidence in support of a request that they not be required to decommission the project at that time.

An exception to the requirement that decommissioning begin if twelve months of no generation occurs would be allowed for a force majeure event, however the Department's view is that the applicant's proposed definition of "force majeure" is exceedingly broad. The Department considers a force majeure to mean fire, earthquake, flood, tornado, or other acts of God and natural disasters; strikes or labor disputes; war, civil strife or other similar violence.

B. Description of work. The applicant's proposal for the manner in which the turbines and other components of the proposed project would be dismantled and removed from the site includes the removal of subsurface components to a minimum of 24 inches below grade, the removal and salvaging of other facilities, and the re-vegetating of disturbed areas.

C. Financial Assurance. The current, estimated cost for decommissioning the project is \$504,600. The applicant proposes that financial assurance for the decommissioning costs would be fully established by year 15 of operation. The applicant proposes to reserve \$33,640 each year from the year the project commences through calendar year 7. The first year's payment would be in place prior to the start of construction. At the end of the seventh year the estimated cost of decommissioning would be reassessed. Based on the new assessment in years 8 through 15 the applicant would make annual contributions of an equal amount each year to fully fund the decommissioning reserve by the end of the 15th year. On or prior to the end of calendar year 15 of the project's operation, the estimated cost of decommissioning (minus the salvage amount) would be reassessed and a copy would be submitted to the Department. The amount that is equal to the remaining balance would be reserved at that time for decommissioning and site restoration.

20. TANGIBLE BENEFITS:

In its application the applicant described tangible benefits that the project would provide to the State of Maine and to the host communities, including economic benefits and environmental benefits.

The applicant states that its proposal would benefit the host communities and surrounding areas through construction-related employment opportunities. These would include tree clearing and excavation jobs, and jobs in businesses that support construction such as lodging, restaurant, fuel and concrete supply.

Communities Benefits Agreement. The Penobscot County Commissioners are scheduled to vote on the Community Benefits Agreement on July 10, 2012. The Department is still evaluating this portion of the application.